On December 17th the temperature in the morning was 100.6° F.; the pulse 108, of good volume. He had passed a motion on the previous night. Respiration was less laboured. Flatus had been passed; abdominal distension was much less and the patient felt better. A morphine injection was given at bedtime.

On December 18th the pulse was 126; he had slept well. In the evening he passed five loose motions. Morphine was repeated.

On December 19th the pulse was 110; he had slept very well; the bowels had been moved three times only. Bismuth and morphine was given internally. The abdomen became distended, but this was relieved by a soap enema.

On December 20th the morning temperature was 99.8°, the pulse 108 and of good volume. He had passed only one motion, and had slept well after a chloral and bromide draught.

From December 21st to 27th the temperature ran an irregular course; the bowels also moved freely, but no attempt was made to check the motions completely, as it produced distension and discomfort. Whenever the motions were too frequent bismuth and morphine were given internally. In the meantime he was given digitalis and nux vomica in a mixture, and was fed on cow's milk, malted milk, chicken broth, liquid peptonoids, brandy, etc. From December 27th, 1907, to January 1st, 1908, his temperature was normal, but there was then again a slight rise, not exceeding 99° F.

The abdominal wound became infected, and had to be dressed daily. At one time a little faecal matter passed through the lower end of the wound, but it has since ceased. Now the wound is almost healed, and the patient is enjoying ordinary diet. Widal's test proved negative three times.

Irrigation of the peritoneal cavity at the time of the operation is not attended with the best results. I believe it tends to spread the infection all over the cavity, and at the same time dilutes the antibodies formed by the organism to resist the invasion of the micro-organism; therefore the less the interference the better the result. Gauze drainage acts much better than rubber tubes by virtue of its capillary attraction. After the fourth day the abdominal cavity may be irrigated with a mild antiseptic lotion such as sterilized boric, as was done in this case.

I must express my gratitude to my house-surgeon, Dr. T. de Krelser, for the great attention and care bestowed on this case.

ON THE METHOD OF MEASURING THE SYSTOLIC PRESSURE IN MAN, AND THE ACCURACY OF THIS METHOD.

BY

LEONARD HILL, M.B., F.R.S. and MARTIN FLACK, B.A., B.M.Oxon.

THE systolic pressure is usually obtained by means of the armlet or cuff independently invented by Riva Rocci and Hill and Barnard. The armlet may be used with a mercurial or spring manometer. The pressure is raised until the radial pulse is obliterated, the armlet being applied at the level of the heart to avoid the influence of the hydrostatic pressure of the column of blood in the body, and so obtain the true systolic pressure of the heart. One of us (L. H.) has perfected recently a form of sphygmometer which serves the same purpose as the armlet and mercurial manometer, is as accurate, far simpler and quicker in use, and can be carried in the waistcoat pocket. The instrument consists of a rubber bag, about 1½ in. in diameter, and enclosed in a silk cover, which is connected by a short length of tubing to a straight glass tube—the gauge. The gauge is carried in a case like that of a clinical thermometer. It consists of a tube open at one end and expanding into a small air space at the other end. Near the open end is a side hole. The closed end is formed of an inch of solid glass to hold the gauge by, so that the air space is not heated by the fingers. On placing the open end of the gauge in water the water rises up to the side hole and forms a meniscus there. This is the zero of the scale, the tube being graduated up to 250 mm. Hg. The tube of the bag is slipped over the open end so as to cover the side hole. The bag must not be blown out to distension, but be about two-thirds full of air. The subject is given the gauge to hold by its solid end; and the observer takes the wrist of the subject, places it at the heart level, and, covering the bag with his fingers and palm, presses it down over the radial artery, his thumb being behind the wrist. With the index finger of the other hand the observer keeps the radial obliterated to prevent a pulse re-entering from the anastomosis with the ulnar artery. With his second finger placed between the index and the bag he feels when the pulse is obliterated by the pressure of the bag, and then reads the position of the top of the meniscus in the gauge. The bag, being large, flaccid, and entirely enclosed by its silk cover and the fingers (its tube escapes between them), takes the place of the leather cuff and the bag of the armlet. Small unenclosed bags give untrustworthy readings, for part of the pressure applied goes in distorting the rubber bag, and is not transmitted to the artery. After use the fluid is jerked out of the gauge. Care must be taken on refilling that there is no water in the side hole, to prevent the meniscus rising. The side hole can easily be cleared by blowing into it, and the orifice of the tube can be cleared by the bristle of a nailbrush. The instrument is made by Mr. Hicks, 8, Hatton Garden, E.C.

Considerable doubt as to the accuracy of the obliteration method of measuring the systolic blood pressure has been expressed recently, particularly by Dr. William Russell.[1] It has been asserted that much of the pressure applied by the armlet method may go to compressing the stiff wall of a degenerated or contracted artery. Herringham and Womack have just published a series of observations in which they found that the resistance of the wall of the *post-mortem* brachial artery may vary from 4 to 34 mm. Hg. They say that the resistance does not vary with age; that at every age exceptional cases occur; that the extremes vary greatly and irregularly; that the two brachials may differ by as much as 10 mm. Hg. The same was found true of the carotids and iliacs. Their results, in our opinion, point to varying *post-mortem* contraction of the arteries as the cause of the resistance—*post-mortem* contraction which is excited by injury and relaxed by freezing, and has been so fully and ably studied by MacWilliam.[2] We have no right to assume that much *post-mortem* contraction occurs in the living artery. This contraction is the natural response to injury which causes the closure of cut and torn arteries. Moreover, it is a well-established fact that obliteration of a living artery excites it to relax, and thus renders error from the resistance due to a contracted state unlikely. We have tested the accuracy of the obliteration method on man in the two following ways, and both ways, as far as our tests go, show that the method is an accurate one.

I.—THE GRAVITY METHOD.

It has been proved by Mummery and also by one of us (L. H.) that the obliteration pressure in the femoral of the dog is the same (within 1 or 2 mm. Hg) as the systolic pressure taken in the opposite femoral with a cannula and Hürthle manometer. It has been proved by one of us (L. H.) that in a dog placed in a vertical posture, head upwards, the pressure in the femoral artery is higher than in the carotid by the hydrostatic pressure of the column of blood which separates the two points of measurement, while, if the dog is turned head downwards, it is higher in the carotid than in the femoral by the same column of blood. The pressures were measured directly with cannulae and mercury manometers.

Carrying out similar observations on man with the aid of two armlets and two mercurial manometers, we obtained like results. It is very improbable that this would be the case if the resistance of the arterial wall entered into the readings, for the contraction of the arteries varies with the pressure they have to support and with the control of the vasomotor nerves, and both factors are modified very greatly by change of posture. In the case of sclerosed arteries, it is unlikely that any two of them would be degenerated and stiffened to a like extent.

On students we have placed one armlet round the upper arm and another round the calf, and used the pulse in the radial at the wrist and posterior tibial artery at the ankle as the index of obliteration. One of us controlled the pump and read the manometer, while the other felt both arteries and signalled the moments of obliteration. It is essential that the readings of the two arteries be taken together and not successively, to avoid errors arising from oscillations of pressure due to the varying attention or excitement of the subject.

We took the readings with the student (1) lying supine in the horizontal posture; (2) standing with the observed leg relaxed and the weight thrown on the other leg; (3) lying supine with the legs raised into the L-shaped position; (4) hoisted up by rope and pulley into the vertical head-down posture, the rope being attached round the foot of the leg which was not observed, and the observed leg attached to this leg by a bandage, so that the posterior tibial artery could be felt at the ankle.

The readings were taken both on raising and lowering the pressure repeatedly and the average taken.

Subject.	Posture.	Brachial Artery, Pressure in mm. Hg.	Posterior Tibial Artery, Pressure in mm. Hg.	Difference in mm. Hg.	Height of Column separating Armlets in cm.	Difference Calculated from Height of Column in mm. Hg.
H. H. R.	Horizontal	140	138	**2**	—	—
	Standing	136	204	**68**	89	**68.5**
	L posture, legs up	122	76	**46**	60	**46.1**
	Vertical head down	148	70	**78**	1010*	**77.7***
P. H. R.	Horizontal	126	126	—	—	—
	Standing	140	204	**64**	86	**66.1**
	L posture, legs up	132	78	**54**	65	**50.0**
	Vertical head down	116	42	**74**	91*	**70.0***

* The arm was not in quite the same position in regard to the heart level as in the standing posture. It had sunk headwards, so that the column of blood separating the two points of measurement was longer.

Considering the difficulty of reading sharply the return of the feeble posterior tibial pulse in the head-down posture, the agreement of the calculated and observed differences is astonishingly near. A most interesting point in these observations is the indication that they give that while the pressure which the heart has to overcome does not alter greatly, the pressure in the cerebral arteries is kept approximately the same in the horizontal, standing, and vertical head-down postures, in spite of the enormous differences in the effect of gravity.

Thus, in P. H. R. the pressure at heart-apex level was approximately 125 in the horizontal posture, 140 in the standing, and 110 in the vertical head-down posture. The vertical distance from base of brain to armlet in the standing posture was about equal to 20 mm. Hg; so that, deducting this amount, the pressure in the circle of Willis would be about 120 mm. Hg. In the vertical head-down posture the subject kept his head bent up somewhat, so that the vertical column separating armlet and base of brain was less—say, equal to 10 to 15 mm. Hg; and, adding this, the pressure in the circle of Willis would be about 120 mm. Hg. In the horizontal posture it was actually 126 mm. Hg. In the case of the arteries of the legs there was no such regulation. At the level of the calf the pressure was 126 in the horizontal, 204 in the standing, and 42 in the vertical posture. The regulative mechanisms engaged are (1) constriction of the arteries, (2) the output per minute of the heart, (3) support of the venous and capillary system by the muscles, (4) the respiratory pump. In the standing posture the pulse is more rapid, the arteries in the abdomen and limbs constricted, the skeletal muscles braced up, the respiratory pump more active.

In the case of patients with high arterial pressure we have applied the gravity method to the two brachials, one arm being held up and the other down, and the pressure read in two armlets at the same time.

In one case of aneurysm, the systolic pressure varied so much with successive beats that no good readings could be obtained.

Our second method, we think, proves with certainty the accuracy of the obliteration method. We have, it is true, up to now tried it in only a few cases, but we commend the trial of this method to those who wish to test the matter further on cases where readings are high and arteries thickened. We place one armlet round the

Case.	Difference in Height Measured equal to mm. in Hg.	Difference in Pressure Observed.	Arterial Pressure.
Sclerosis, anginal pain, emphysema	17.0	17.5	140
Chronic nephritis, thick arteries	10	10	185
Diabetes, small contracted arteries	15.2	15	175
Chronic nephritis, arterio-sclerosis	11.6	12	197
Paraplegia	11.55	11	175

Many experiments on healthy subjects gave the calculated readin within 0.2. mm. Hg.

brachial, and another narrower one round the forearm of the same arm. We find the obliteration pressure with the first armlet. Suppose it is 150 mm. Hg. We lower the pressure in this armlet to, say, 145 mm. Hg, so that the arterial blood can get through into the limb, but cannot get out of the veins of the limb until the pressure in the veins rises above 145 mm. Hg.

Allowing sufficient time for the veins to fill, we then measure the pressure in one of the superficial veins, and find that it does finally reach this pressure thus: We raise the pressure in the second armlet above 1.45 mm. Hg, and choosing a suitable vein above this armlet, by stroking, empty it upwards past the next valve, then quickly lowering the pressure in the second armlet observe the pressure at the moment when the vein fills from below. One of us watches the vein, and signals the moment of filling; the other the manometer. We repeat this observation several times. Now if we find the pressure in the vein reaches 145, we know that the obliteration pressure was correct within 5 mm. Hg, for no one can suggest that the wall of a superficial vein offers any noteworthy resistance; and as the venous pressure is found by the second armlet to be 145 mm. Hg, and equal to the pressure in the first armlet, and as the pressure in this is within 5 mm. Hg of the obliteration pressure, the latter is proved to be correct within 5 mm. Hg.

Subject.		Obliteration Pressure.	Pressure Maintained in Brachial Armlet.	Pressure Measured in Veins of Forearm.
G. T. ...	Sclerosed arteries	156	150	148
F. T., aged 59	—	122	110 114	110 114
G. ...	Pipe-like arteries full of plaques	136	120 130	118 176
G. M. ...	Hard arteries	148	142	140
T. C. ...	Granular kidneys, thickened tortuous arteries	194	184	100 First reading. 110 Second ,, 140 Third ,, 180 Final reading after waiting long enough for venous pressure to rise.
A. J. ...	Phthisis, tortuous arteries	(1) 106	100	40 First reading, 80 Second ,, 100 Final ,,
		(2) 106	95	36 First ,, 72 Second ,, 92 Final ,,
		(3) 106	100	40 First ,, 60 Second ,, 68 Third ,, 92 Fourth ,, 102 Final ,,

We have also tested the method on several normal men.

To carry out this method properly a vein must be chosen which does not fill from above, or, at any rate, not quickly. With such high pressures in the veins the valves

leak, and in some cases the leakage is such that we have not been able to carry out the method. A slender vein can generally be found which answers the purpose. The pressure in the second armlet must be lowered quickly directly the vein has been stroked empty, so that the filling of the vein from below may be observed before it can leak full from above.

In cases of high pressure it is difficult to get patients to endure long enough the somewhat painful feeling of pressure which results from the maintenance of the first armlet at a pressure close to the obliteration pressure. It is necessary to work quickly in these cases, and give a rest between each test.

REFERENCES.
[1] BRITISH MEDICAL JOURNAL, October 10th, 1908. [2] *Proc. Roy. Soc.*, lxx, 1902.

TREATMENT OF INOPERABLE CANCER BY HYPOCHLORITES.

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DURING the past three or four years I have, when called upon to deal with cases of inoperable cancer, employed a method of treatment which is entirely novel so far as I am aware. The cases in which I have carried it out thoroughly are not numerous, and at present only the three recorded are of sufficiently old standing and sufficiently verified as regards diagnosis.

CASE I.

A woman employed as a cook in a large block of flats in London. In October, 1901, ovariotomy was performed on her at Guy's Hospital and the right ovary removed. Little relief from her previous symptoms resulted, and she continued to attend as an out-patient, the uterus being curetted on two or three occasions. As she continued to fail in health she was readmitted in November, 1902. On laparotomy a mass was found in the pelvis, suggesting a malignant growth with a secondary deposit in the omentum. No microscopic examination was made, but from the relations of the mass and its appearance it was concluded that it was a case of malignant disease. Consequently the abdomen was closed without further interference, and the patient discharged in February, 1903.

Ten months later, or in December, 1903, the special treatment in question was commenced. By May, 1904, five months later, the patient was so far recovered that she was able to do all her household work and to go out bicycling, riding as far as thirty-five miles in a day. In appearance and feeling she was perfectly well. Nevertheless, the treatment was continued for several months longer. At the date of writing, four years later, this patient is still in good health and earning her living by her own exertions.

CASE II.

A woman who had a radical operation for mammary carcinoma at Guy's Hospital in March, 1907; the diagnosis of cancer was verified by microscopic examination. Two months after she had been discharged, some enlarged glands were noticed on the left side of the neck, and these were removed surgically at the Soho Hospital for Women. Again, two months later, further growth was observed in the same locality, whereon the special treatment was commenced. In two months' time the growth had disappeared, and at the time of writing, eighteen months later, she is in absolutely good health, feeling well, taking active exercise, and pursuing her ordinary occupation—that of a school teacher.

CASE III.

A French gentleman, who, through a bicycle accident, received a blow on the right breast. A tumour formed, and was diagnosed in May, 1904, as a malignant growth. In consequence a radical operation was performed at King's College Hospital in the same month, the growth, on microscopic examination, being found to be a spheroidal celled carcinoma. The patient was seen now and then by his surgeon, and in 1906, though the cicatrix seemed in good order, the conclusion was reached by this surgeon that there was a secondary and inoperable growth in the sternum itself. Subsequently the patient had *x* rays applied a few times and received some injections of what was probably a culture of *M. neoformans*.

Finally, in November, 1907, he placed himself in the hands of the writer of this note, who commenced the special treatment in question. It was continued until May, 1908, at which date all evidence of new growth had disappeared, and the patient was apparently in perfect health, locally and generally. That is still the position at the date of writing, eight months later.

In describing these cases it has not been thought necessary to enter into finer details of their clinical course, but their more essential features are all duly recorded. It is conceivable, of course, that in Case I the growths seen and deemed by the operator to be malignant and inoperable may have been tuberculous. Such cases do occur, but it would be a strange coincidence if one followed a previous operation for cystic disease of the ovary. In the other two cases the initial disease was verified microscopically, and, as in the first case, the recurrences were deemed by surgeons holding positions on the senior staff of important London hospitals to be malignant.

I propose to report the conditions of these three patients again a year hence, whatever it may be.

The treatment employed was the injection of a solution of hypochlorites of potassium and sodium. This I prepare by dissolving 5 grams of KOH and 4 grams of NaOH in a litre of distilled water, and passing it through washed chlorine gas. Of this solution, 1½ to 2 c.cm. were injected daily for a varying period, usually under the skin over the deltoid muscle or over the great trochanter, so that the solution might enter the system at a site in the general neighbourhood of the lymphatic glands. The growth itself and the skin over it were carefully avoided. So, too, was the use of alcohol during treatment. I use an ordinary all-glass syringe with a platinum needle (to avoid corrosion), and in making the injections adopt ordinary aseptic precautions. There is a varying amount of local pain, lasting for from two to five minutes. I have not seen any reaction.

Should any medical reader care to try the treatment and desire further details, they are, of course, at his disposition.

THE TREATMENT OF CANCER WITH COCAINE.

BY ROBERT MUNN GILCHRIST,
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THE first time I used cocaine in the treatment of cancer was as a local application in a very painful secondary case, the primary growth having been removed a few weeks before by the late Dr. McGill of Leeds. On its recurrence, I saw Dr. McGill along with my patient, and he at once came to the conclusion that further operation was out of the question. This was a very instructive case, as, being on the face, you could watch the progress of the growth under varying forms of treatment.

Before the use of cocaine, from the first indication of a fresh deposit until ulceration occurred was a period of about three days, but after the use of cocaine this period was lengthened to as many weeks, thus showing that cocaine had some influence in retarding the growth.

In July, 1891, discussing with my late friend, Dr. Calderwood, "the Mattei treatment of cancer," I said that the only agent I had ever used having any effect on the growth of abnormal epithelial tissue was cocaine, and having a very suitable case under my care at the time, I determined to try the effect of the internal administration of cocaine.

CASE I.

Mrs. C. was 49, and almost *in articulo mortis*. Extreme anorexia, probably from secondary deposits in stomach and liver in this a case of uterine cancer, had brought her into this condition. Having an idiosyncrasy to opiates, whichever way administered, made this case not a very easy one to treat, especially as she was suffering very much pain. I commenced the treatment with cocaine by giving her one-eighth of a grain every three hours, and gradually increasing it to one-quarter of a grain. The growth in this case occupied almost the whole of the vagina, and involved both bladder and rectum. She had excruciating pain, retention of urine, general anasarca with albuminuria, and most alarming attacks of haemorrhage. The effect of the administration of cocaine was most marked and immediate. The haemorrhage became less and less, the pain was very much relieved, the anasarca and albuminuria disappeared, sickness stopped, and she again began to take her food with relish.

She continued to improve for six months, when, being much upset by her husband, she had an attack of meningitis, from which she died.

CASE II.

Miss W. consulted me about her breast in May, 1891. I found a growth involving the whole of the left breast, and enlargement and induration of the axillary glands. The skin over the breast was becoming affected, and I advised immediate removal. To this she would not consent. I then commenced treatment by administering cocaine both internally and externally. The pain, which had been the most important factor, became to all intents and purposes a negligible quantity. The skin broke down in many places over the breast, but healed. The growth seemed to remain in a stationary condition, and the glands in the armpit, if anything, became smaller. She continued in